## *MODIS Land Surface Temperature (LST) and Emissivity (MOD 11, MOD 11comb, MOD 11adv)*

### Product Description

The Aqua MOD11 product is similar to the Terra MOD11 product (see p. 191 in Volume 1). It contains Level 2 and 3 LST and emissivity retrieved from Aqua MODIS data at spatial resolutions of 1 km and 5 km over global land surfaces under clear-sky conditions. The generalized split-window LST algorithm will be used to retrieve LST for MODIS pixels with known emissivities in bands 31 and 32. The physics-based day/night LST algorithm will be used to simultaneously retrieve surface band emissivities and temperatures from a pair of daytime and nighttime MODIS observations in bands 20, 22, 23, 29, and 31-33 over all types of land cover.

The MOD11comb (combination) product contains Level 2 and 3 land-surface emissivities and temperatures retrieved through the combination of Aqua and Terra MODIS data. The MOD11comb surface temperature, with an enhanced diurnal feature, will be more suitable for various applications than an Aqua or Terra product alone.

In the early post-launch period, the Aqua MOD11adv (advanced) product will include Level 2 and 3 land surface emissivities and temperatures retrieved by an advanced LST algorithm that also corrects the effects of thin cirrus clouds and aerosols with inputs from MODIS atmospheric products.

### Research and Applications

Land-surface temperature is a good indicator of both the energy balance at the Earth's surface and the greenhouse effect because it is one of the key parameters in the physics of the land-surface processes. It is required for a wide variety of climate, hydrological, ecological, and biogeochemical studies. This product will be used in generating other MODIS products and in a variety of EOS interdisciplinary studies.

### Data Set Evolution

The Aqua MODIS LST products build and improve upon the experience of LST retrieval from MODIS Airborne Simulator (MAS) data and Terra MODIS data.

### Suggested Reading


Justice, C. *et al.*, 1998.

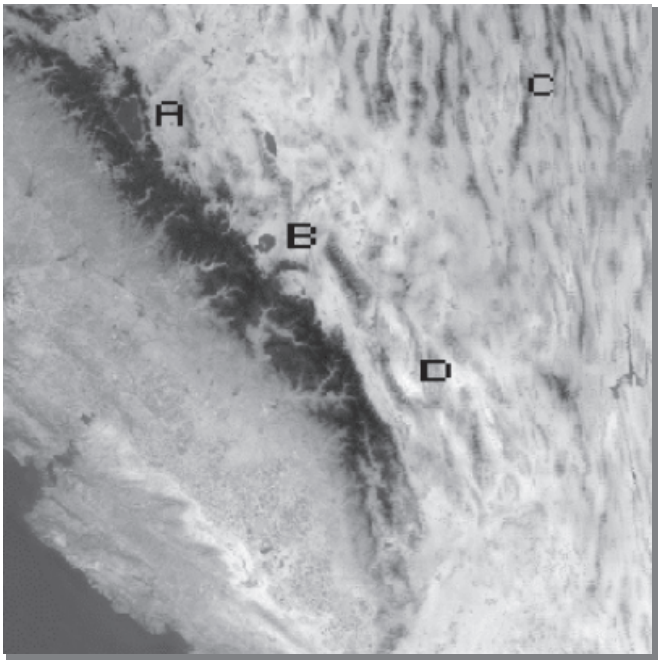
Running, S.W. *et al.*, 1994.

Salisbury, J.W., and D.M. D'Aria, 1992.

Snyder, W., and Z. Wan, 1996.

Wan, Z., and J. Dozier, 1996.

Wan, Z., and Z.-L. Li, 1997.


**Sample MOD 11 Level-2 LST Image generated from Terra MODIS data in bands 31 and 32 on April 4, 2000 (19:15 UTC) in California and Nevada. The dark area in the lower left corner is the Pacific Ocean. The sites to the left of symbols A, B, C, and D are Lake Tahoe, Mono Lake, Railroad Valley, and Death Valley. The coincident IR radiometer measurement data over Mono Lake agree with the MODIS LST value within 1.2K. (Image developer: MODIS Science Team / MODLAND / Z. Wan, UCSB).**

*(MOD 11, MOD 11comb, MOD 11adv, continued)*

## MODIS Land Surface Temperature and Emissivity Summary

*Coverage:* Global land surface

*Spatial/Temporal Characteristics:* 1 km, 5 km, and 0.5°/8-day and monthly

*Key Science Applications:* Inputs to climate, hydrological, ecological modeling

*Key Geophysical Parameters:* Land surface temperature, land surface emissivity

*Processing Level:* 2, 3

*Product Type:* Standard, at-launch and post-launch

*Maximum File Size:* 24 MB

*File Frequency:* 288 /day

*Primary Data Format:* HDF-EOS

*Additional Product Information:* http://modis-land.gsfc.nasa.gov/products/products.asp?ProdFamID=8

*DAAC:* EROS Data Center

*Science Team Contact:* Z. Wan

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